DENVER, COLORADO 80206
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STATUS REPORT NASA PROJECT NASr-221

SUBJECT: Fourth Quarter Report for the period January 1, 1965 to March 31, 1965

Considerable progress was made during this period in the acquisition and the local management of the lungfish.

A. We have apparently achieved a solution to the problem of shipment of large fish from Africa. This was accomplished by the construction of a small, tin trunk which was then insulated and into which the fish were placed in individual large polyethylene bags, tightly sealed with sufficient oxygen to last the fish for four days and enough water to keep them wet. In the last month, we have received two successful shipments of fish utilizing this technique. The routing was re-arranged to bypass a re-shipment at Kennedy International Airport.

B. A major portion of the aquarium at the Colorado State University laboratory of Dr. Frank South, was completed, including automatic temperature controls, water filters, re-surfacing of tubs and protection devices to prevent the fish from escaping out of the tubs or through water lines. We now have in residence

in the aquarium, twelve lungfish, several of which are large specimens in the four to six pound category.

During this period, I was successful in forcing artificial aestivation on one fish of medium size. This fish had been freshly received from Africa and it is not known whether he had prepared himself for aestivation. In any event, using suitable mud and weeds, the water level was successfully lowered, gradually forcing him to excavate a tunnel into which he escaped as the water level fell below the mud surface. This fish was in a state approximating aestivation for a period of about six weeks, although he could be aroused by mechanical stimulation of his nose. He died at the end of that period and at autopsy, tissues were obtained for extraction. The photograph of this specimen is attached.

D. Extracting the plasma and the tissues of the lungfish has proven to be a problem. The methodology for this is being worked on by Dr. Dalton Jenkins of the University of Colorado. He has made considerable strides in the chemical processes necessary for separation, extraction and purification of various fractions. Extractions of both non-aestivating and aestivating fish are awaiting the completion of Step E, detailed below.

E. Metabolic chambers are being designed and

built at Colorado State University for two purposes: (1) to study changes in metabolism after the injection of extracts in test guinea pigs; (2) to study the metabolism of the non-aestivating and aestivating lungfish. At the present time, it is thought that we would use CO_2 production for the first and oxygen consumption for the second.

F. During the first portion of the coming quarter, attempt will be made to transport to the United States by boat, some large aestivating fish from the Gambia River on the east coast of Africa. These fish are vigorous aestivators but are of a different species than those hitherto obtained, namely, Protopterus annectens.

Very respectfully submitted,

Henry Swan M.D.

Henry Swan, Chief Investigator

HS:jc